Claims.

1. A method of inspecting an article, comprising the steps of:

acquiring a first frame image of a first field of view of said article;

acquiring a second frame image of a second field of view of said article, wherein said first field of view and said second field of view have an overlap; and

identifying blemish locations having substantially constant frame coordinates on said first frame image and said second frame image.

2. The method according to claim 1, further comprising the step of identifying a first defect location on said first frame image and a second defect location on said second frame image, said first defect location being displaced from said second defect location by a frame displacement that is defined by said overlap, wherein at least one of said first defect location and said second defect location is distinct from any of said blemish locations.

3. The method according to claim 2, wherein both of said first defect location and said second defect location are distinct from said blemish locations.

4. The method according to claim 2, further comprising the step of adjusting said overlap such that said frame displacement is distinct from displacements between members of pairs of system blemishes that are aligned in a scan direction.

5. The method according to claim 2, further comprising the steps of:

varying a detection threshold of said first frame image and said second frame image; and

repeating said step of identifying said first defect location on said first frame image and said second defect location on said second frame image, so as to identify all defect locations on said article.

6. The method according to claim 2, further comprising the steps of:

applying a super-resolution technique to said first frame image and said second frame image; and

repeating said step of identifying said first defect location on said first frame image and said second defect location on said second frame image, so as to identify all defect locations on said article.

7. The method according to claim 1, wherein said steps of acquiring said first frame image and acquiring said second frame image are performed by impinging pulsed coherent light on said article.

8. The method according to claim 1, wherein a focal plane of said first frame image differs from a focal plane of said second frame image.

9. The method according to claim 1, wherein said overlap of said first field of view and said second field of view is oriented in a scan direction.

10. The method according to claim 1, wherein said overlap of said first field of view and said second field of view is oriented orthogonal to a scan direction.

11. The method according to claim 1, wherein said overlap is at least 50% of an area of said first frame image.

12. A method of inspecting an article employing an optical imaging system, comprising the steps of:

preparing a pre-scan mask of blemishes of said optical imaging system;

determining blemish displacements between pairs of said blemishes that are aligned in a scan direction;

selecting a frame overlap of consecutive image frames of said article that is distinct from all of said blemish displacements;

acquiring a first frame image and acquiring a second frame image of said article that overlaps said first frame image at said frame overlap; and

masking said first frame image and said second frame image with said pre-scan mask.

13. The method according to claim 12, further comprising the step of identifying a first defect location on said first frame image and a second defect location on said second frame image, said first defect location being displaced from said second defect location by a frame displacement that is defined by said frame overlap between said first frame image and said second frame image, wherein at least one of said first defect location and said second defect location is distinct from any of said blemishes on said pre-scan mask.

14. The method according to claim 13, further comprising the steps of:

varying a detection threshold of said first frame image and said second frame image; and

repeating said step of identifying said first defect location on said first frame image and said second defect location on said second frame image, so as to identify all defect locations on said article.

15. The method according to claim 13, further comprising the steps of:

applying a super-resolution technique to said first frame image and said second frame image; and

repeating said step of identifying said first defect location on said first frame image and said second defect location on said second frame image, so as to identify all defect locations on said article.

16. The method according to claim 12, wherein said steps of acquiring said first frame image and acquiring said second frame image are performed by impinging pulsed coherent light on said article.

17. The method according to claim 12, wherein a focal plane of said first frame image differs from a focal plane of said second frame image.

18. The method according to claim 12, wherein said frame overlap is oriented in said scan direction.

19. The method according to claim 12, wherein said frame overlap is oriented orthogonal to said scan direction.

20. An optical inspection apparatus of inspecting an article, comprising:

a scanner for illuminating said article in a scan direction;

a detector for detecting frame images of said article;

beam directing optics for directing light from said article to said detector;

a controller for controlling said scanner and said detector to acquire said frame images portions at a frame overlap; and

an image processor adapted to prepare a pre-scan mask of system blemishes, wherein said frame overlap is selected to be distinct from all displacements between pairs of said blemishes that are aligned in said scan direction, said image processor being further adapted to mask said frame images with said pre-scan mask.

21. The optical inspection apparatus according to claim 20, wherein said image processor is further adapted to vary a detection threshold of said blemishes.

22. The optical inspection apparatus according to claim 20, wherein said image processor is further adapted to apply a super-resolution technique to said frame images to identify defect locations therein.

23. The optical inspection apparatus according to claim 20, wherein said detector comprises a plurality of cameras that

simultaneously image overlapping fields of view on said article.

24. The optical inspection apparatus according to claim 20, wherein said detector comprises a plurality of cameras, and said controller in a first mode of operation configures said cameras to image overlapping fields of view on said article and in a second mode of operation configures said cameras to image adjacent non-overlapping fields of view thereon.

25. A method of inspecting an article, comprising the steps of:

directing a beam from said article through optics along a plurality of optical paths;

disposing a first camera in one of said optical paths, said first camera having a first field of view of said article and a second camera in another of said optical paths, said second camera having a second field of view of said article, wherein said first field of view and said second field of view have an overlap;

acquiring a first frame image of said article with said first camera, and acquiring a second frame image of said article with said second camera;

identifying blemish locations having substantially constant frame coordinates on said first frame image and said second frame image; and

identifying a defect in said first frame image and in said second frame image, wherein a frame displacement of said defect corresponds to said overlap, and wherein a location of said defect on at least one of said first frame image and said

second frame image avoids said frame coordinates of said blemish locations thereon.

26. The method according to claim 25, wherein frame coordinates of said defect on said first frame image and on said second frame image are distinct from said blemish locations.

27. The method according to claim 25, further comprising the step of adjusting said overlap such that said frame displacement is unequal to any displacement between members of pairs of system blemishes that are aligned in a scan direction.

28. The method according to claim 25, wherein said overlap is at least 50% of an area of said first frame image.

29. The method according to claim 25, further comprising the steps of:

varying a detection threshold of said first frame image and said second frame image; and

repeating said step of identifying a defect on said first frame image and on said second frame image, so as to identify all defect locations on said article.

30. The method according to claim 25, further comprising the steps of:

applying a super-resolution technique to said first frame image and said second frame image; and

repeating said step of identifying a defect on said first frame image and on said second frame image, so as to identify all defect locations on said article.

31. The method according to claim 25, wherein said steps of acquiring said first frame image and acquiring said second frame image are performed by impinging pulsed coherent light on said article.

32. The method according to claim 25, wherein a focal plane of said first camera differs from a focal plane of said second camera.

33. The method according to claim 25, wherein said overlap of said first field of view and said second field of view is oriented in a scan direction.

34. The method according to claim 25, wherein said overlap of said first field of view and said second field of view is oriented orthogonal to a scan direction.

35. An optical inspection apparatus, comprising:

a plurality of image sensors; and

beam directing optics, which are adapted to direct a collection beam from a surface of an article under inspection onto said image sensors, said optics having a first configuration in which said optics direct said collection beam onto said image sensors so that all said image sensors have a common field of view, and a second configuration in which said image sensors have different fields of view comprising a first field of view and a second field of view.

36. The optical inspection apparatus according to claim 35, wherein said optics impinge said collection beam onto said image sensors with equal fluence.

37. The optical inspection apparatus according to claim 35, wherein said image sensors comprise three detectors, and said optics comprise two mirrors.

38. The optical inspection apparatus according to claim 35, wherein in said first configuration said image sensors are focused on different planes relative to a surface of said article.

39. The optical inspection apparatus according to claim 35, wherein in said second configuration said first field of view has an overlap with said second field of view.

40. The optical inspection apparatus according to claim 39, wherein said overlap exceeds 50 per cent, wherein a frame displacement between said first field of view and said second field of view is distinct from displacements between members of pairs of system blemishes that are aligned in a scan direction.

41. The optical inspection apparatus according to claim 35, further comprising at least one beam splitter disposed in said collection beam for directing at least portions of said collection beam toward said image sensors, respectively.

42. The optical inspection apparatus according to claim 41, wherein said beam splitter comprises two beam splitters, and said image sensors comprise three image sensors.

43. The optical inspection apparatus according to claim 41, further comprising a mirror disposed in said collection beam, and a beam blocking means moveable to block a portion of said collection beam from reaching said mirror, and an opto-mechanical subsystem for displacing said beam blocking means and said beam splitter between operating positions and non-operating positions;

a scanner wherein said article is scanned relative said optics in a scan direction;

wherein in said first configuration said beam blocking means is interposed by said opto-mechanical subsystem so as to block said portion of said collection beam, and said beam splitter is disposed within said collection beam; and

wherein in said second configuration said beam blocking means and said beam splitter are displaced by said opto-mechanical subsystem external to said collection beam, and wherein said first field of view and said second field of view have an overlap, and a frame displacement between said first field of view and said second field of view is distinct from displacements between members of pairs of system blemishes that are aligned in said scan direction.

44. The optical inspection apparatus according to claim 43, wherein said overlap exceeds 50 per cent in said scan direction, wherein said frame displacement is distinct from displacements between said members of pairs of system blemishes that are aligned in said scan direction.

45. The optical inspection apparatus according to claim 43, wherein said overlap exceeds 50 per cent in an orthogonal

direction to said scan direction, wherein said frame displacement in said orthogonal direction is distinct from displacements between said members of pairs of system blemishes that are aligned in said orthogonal direction.

46. The optical inspection apparatus according to claim 43, wherein in said first configuration said image sensors are focused on different planes relative to a surface of said article.

47. A method of inspecting an article, comprising the steps of:

disposing a plurality of image sensors to image said article; and

directing a collection beam from a surface of said article under inspection onto said image sensors, in a first configuration in which all said image sensors have a common field of view, and in a second configuration in which said image sensors have different fields of view comprising a first field of view and a second field of view.

48. The method according to claim 47, wherein said collection beam is directed onto said image sensors with equal fluence.

49. The method according to claim 47, wherein three said image sensors are disposed, and said collection beam is directed toward said image sensors by two mirrors.

50. The method according to claim 47, wherein in said first configuration said image sensors are focused on different planes relative to said surface of said article.

51. The method according to claim 47, wherein in said second configuration said first field of view has an overlap with said second field of view.

52. The method according to claim 51, wherein said overlap exceeds 50 per cent, wherein a frame displacement between said first field of view and said second field of view is distinct from displacements between members of pairs of system blemishes that are aligned in a scan direction.

53. The method according to claim 47, further comprising the step of disposing at least one beam splitter in said collection beam for directing at least portions of said collection beam toward said image sensors, respectively.

54. The method according to claim 53, wherein said beam splitter comprises two beam splitters, and said image sensors comprise three image sensors.

55. The method according to claim 53, further comprising the steps of:

disposing a mirror in said collection beam, and disposing a beam blocking means so as to block a portion of said collection beam from reaching said mirror;

displacing said beam blocking means and said beam splitter between operating positions and non-operating positions;

scanning said article is scanned relative to said image sensors in a scan direction;

wherein in said first configuration said beam blocking means is interposed so as to block said portion of said collection beam, and said beam splitter is disposed within said collection beam; and

wherein in said second configuration said beam blocking means and said beam splitter are displaced external to said collection beam, and wherein said first field of view and said second field of view have an overlap, and a frame displacement between said first field of view and said second field of view is distinct from displacements between members of pairs of system blemishes that are aligned in said scan direction.

56. The method according to claim 55, wherein said overlap exceeds 50 per cent in said scan direction, wherein said frame displacement is distinct from displacements between said members of pairs of system blemishes that are aligned in said scan direction.

57. The method according to claim 55, wherein said overlap exceeds 50 per cent in an orthogonal direction to said scan direction, wherein said frame displacement in said orthogonal direction is distinct from displacements between said members of pairs of system blemishes that are aligned in said orthogonal direction.

58. The method according to claim 55, wherein in said first configuration said image sensors are focused on different planes relative to said surface of said article.